

**ProLight PACK-57FxL-xC8N**  
**57W COB Light-Engine LEDs**  
**Technical Datasheet**  
**Version: 1.2**

# ProLight Opto ® ProEngine Series

## Features

- High flux density of lighting source
- Good color uniformity
- RoHS compliant
- Energy Star binning structure, neutral white and warm white with 2 steps guarantee.
- More energy efficient than incandescent and most halogen lamps
- No UV
- Long lifetime
- 5 year warranty

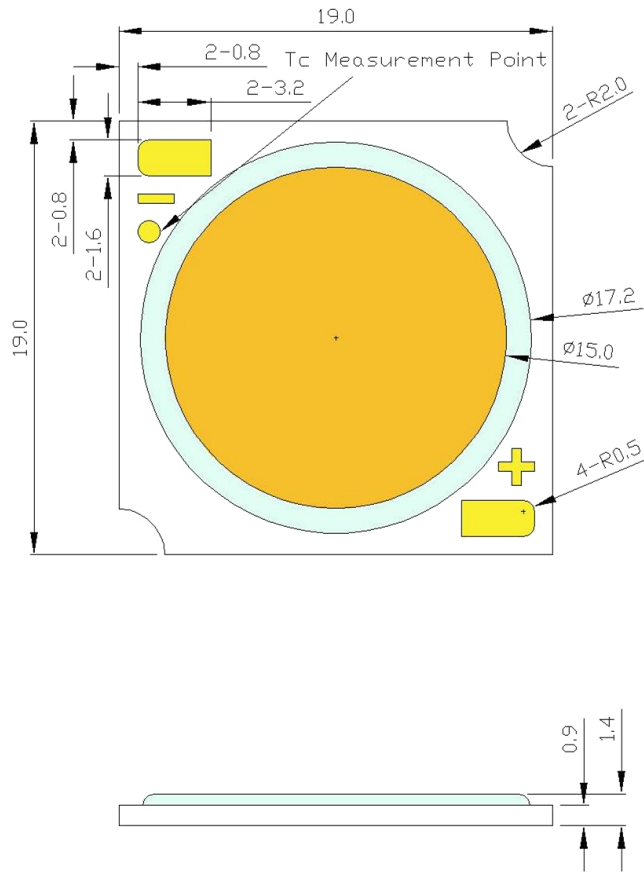
## Main Applications

- Par lighting
- LED Bulb
- Ceiling lighting
- Spot lighting
- Down lighting

## Introduction

·The input power is 57 Watt, the multi-chip ultra high power ProEngine Series delivers never before seen luminous flux output from a single emitter. The superficial illuminating nature of ProEngine makes them the preference in Par lighting, typical applications include commercial down lighting, LED bulb, accent lighting, ceiling lighting and spot lighting.

## Emitter Mechanical Dimensions



### Notes:

1. Slots in aluminum-core PCB for M3 mounting screw.
2. Solder pads are labeled "+" and "-" to denote positive and negative, respectively.
3. Drawing not to scale.
4. All dimensions are in millimeters.
5. Unless otherwise indicated, tolerances are  $\pm 0.30$ mm.
6. **Please do not use a force of over 0.3kgf impact or pressure on the lens of the LED, otherwise it will cause a catastrophic failure.**

\*The appearance and specifications of the product may be modified for improvement without notice.

## Flux Characteristics, $T_c = 25^\circ\text{C}$

Radiation Pattern	Color	Part Number COB	DC Forward Current (mA)		Luminous Flux $\Phi_v$ (lm)		CRI Min.	R9 Min.
			720*	1440	Min.	Typ.		
Lambertian	White	PACK-57FWL-AC8N	720*	1440	3585	4190	70	-
					6345	7415		
	Neutral White	PACK-57FNL-AC8N	720*	1440	3530	4120	70	-
					6250	7290		
	Warm White	PACK-57FVL-AC8N	720*	1440	3390	3960	70	-
					6000	7010		
	White	PACK-57FWL-BC8N	720*	1440	3510	4105	80	0
					6210	7265		
	Neutral White	PACK-57FNL-BC8N	720*	1440	3460	4040	80	0
					6125	7150		
	Warm White	PACK-57FVL-BC8N	720*	1440	3320	3875	80	0
					5875	6860		
	White	PACK-57FWL-DC8N	720*	1440	3090	3610	90	50
					5440	6355		
	Neutral White	PACK-57FNL-DC8N	720*	1440	3045	3555	90	50
					5360	6260		
Warm White	PACK-57FVL-DC8N	720*	1440	2920	3410	90	50	
				5140	6005			
Neutral White	PACK-57FNL-EC8N	720*	1440	2680	3130	95	90	
				4715	5510			
Warm White	PACK-57FVL-EC8N	720*	1440	2570	3005	95	90	
				4520	5290			

- The mark "\*" indicated product is tested and binned at the specified drive current.
- ProLight maintains a tolerance of  $\pm 7\%$  on flux and power measurements.
- ProLight maintains a tolerance of  $\pm 2$  on CRI measurements.
- Please do not drive at rated current more than 1 second without proper heat sink.

## Electrical Characteristics at 720mA, $T_c = 25^\circ\text{C}$

Color	Forward Voltage $V_F$ (V)			Thermal Resistance Junction to Board ( $^\circ\text{C}/\text{W}$ )
	Min.	Typ.	Max.	
White	33.7	36.0	38.3	0.53
Neutral White	33.7	36.0	38.3	0.53
Warm White	33.7	36.0	38.3	0.53

- ProLight maintains a tolerance of  $\pm 1\text{V}$  for Voltage measurements.

## Optical Characteristics at 720mA, $T_c = 25^\circ\text{C}$

Color	Bin Code	Color Temperature CCT			Total included Angle (degrees) $\theta_{0.90\text{V}}$	Viewing Angle (degrees) $2\theta_{1/2}$
		Min.	Typ.	Max.		
White	V0	4740 K	5000 K	5310 K	160	120
	W0	5310 K	5700 K	6010 K	160	120
	X0	6020 K	6500 K	7030 K	160	120
Neutral White	S0	3900 K	4000 K	4070 K	160	120
	M0	2670 K	2700 K	2770 K	160	120
Warm White	N0	2990 K	3000 K	3090 K	160	120
	Q0	3380 K	3500 K	3550 K	160	120

- ProLight maintains a tolerance of  $\pm 5\%$  for CCT measurements.

## Supply Specifications

Part Number	CRI	Color Bin Code						
		V0	W0	X0	S0	M0	N0	Q0
PACK-57F <sub>x</sub> L-AC8N	70	V			V	V		
PACK-57F <sub>x</sub> L-BC8N	80	V	V	V	V	V	V	V
PACK-57F <sub>x</sub> L-DC8N	90	V			V	V	V	V
PACK-57F <sub>x</sub> L-EC8N	95				V	V	V	

## Electro-Optical Characteristics, $T_c = 25^\circ\text{C}$

$I_F$ (mA)	$V_F$ (V)	Power (W)	PACK-57FWL-AC8N		PACK-57FNL-AC8N		PACK-57FVL-AC8N	
			Flux (lm)	lm/W	Flux (lm)	lm/W	Flux (lm)	lm/W
480	34.63	16.62	3115	187.4	3063	184.3	2943	177.1
720*	36.00	25.92	4190	161.7	4120	159.0	3960	152.8
960	37.23	35.74	5265	147.3	5177	144.8	4977	139.2
1200	38.42	46.10	6340	137.5	6233	135.2	5993	130.0
1440	39.53	56.92	7415	130.3	7290	128.1	7010	123.1
$I_F$ (mA)	$V_F$ (V)	Power (W)	PACK-57FWL-BC8N		PACK-57FNL-BC8N		PACK-57FVL-BC8N	
			Flux (lm)	lm/W	Flux (lm)	lm/W	Flux (lm)	lm/W
480	34.63	16.62	3052	183.6	3003	180.7	2880	173.3
720*	36.00	25.92	4105	158.4	4040	155.9	3875	149.5
960	37.23	35.74	5158	144.3	5077	142.0	4870	136.3
1200	38.42	46.10	6212	134.7	6113	132.6	5865	127.2
1440	39.53	56.92	7265	127.6	7150	125.6	6860	120.5
$I_F$ (mA)	$V_F$ (V)	Power (W)	PACK-57FWL-DC8N		PACK-57FNL-DC8N		PACK-57FVL-DC8N	
			Flux (lm)	lm/W	Flux (lm)	lm/W	Flux (lm)	lm/W
480	34.63	16.62	2695	162.1	2653	159.6	2545	153.1
720*	36.00	25.92	3610	139.3	3555	137.2	3410	131.6
960	37.23	35.74	4525	126.6	4457	124.7	4275	119.6
1200	38.42	46.10	5440	118.0	5358	116.2	5140	111.5
1440	39.53	56.92	6355	111.6	6260	110.0	6005	105.5
$I_F$ (mA)	$V_F$ (V)	Power (W)	PACK-57FNL-EC8N		PACK-57FVL-EC8N			
			Flux (lm)	lm/W	Flux (lm)	lm/W		
480	34.63	16.62	2337	140.6	2243	135.0		
720*	36.00	25.92	3130	120.8	3005	115.9		
960	37.23	35.74	3923	109.8	3767	105.4		
1200	38.42	46.10	4717	102.3	4528	98.2		
1440	39.53	56.92	5510	96.8	5290	92.9		

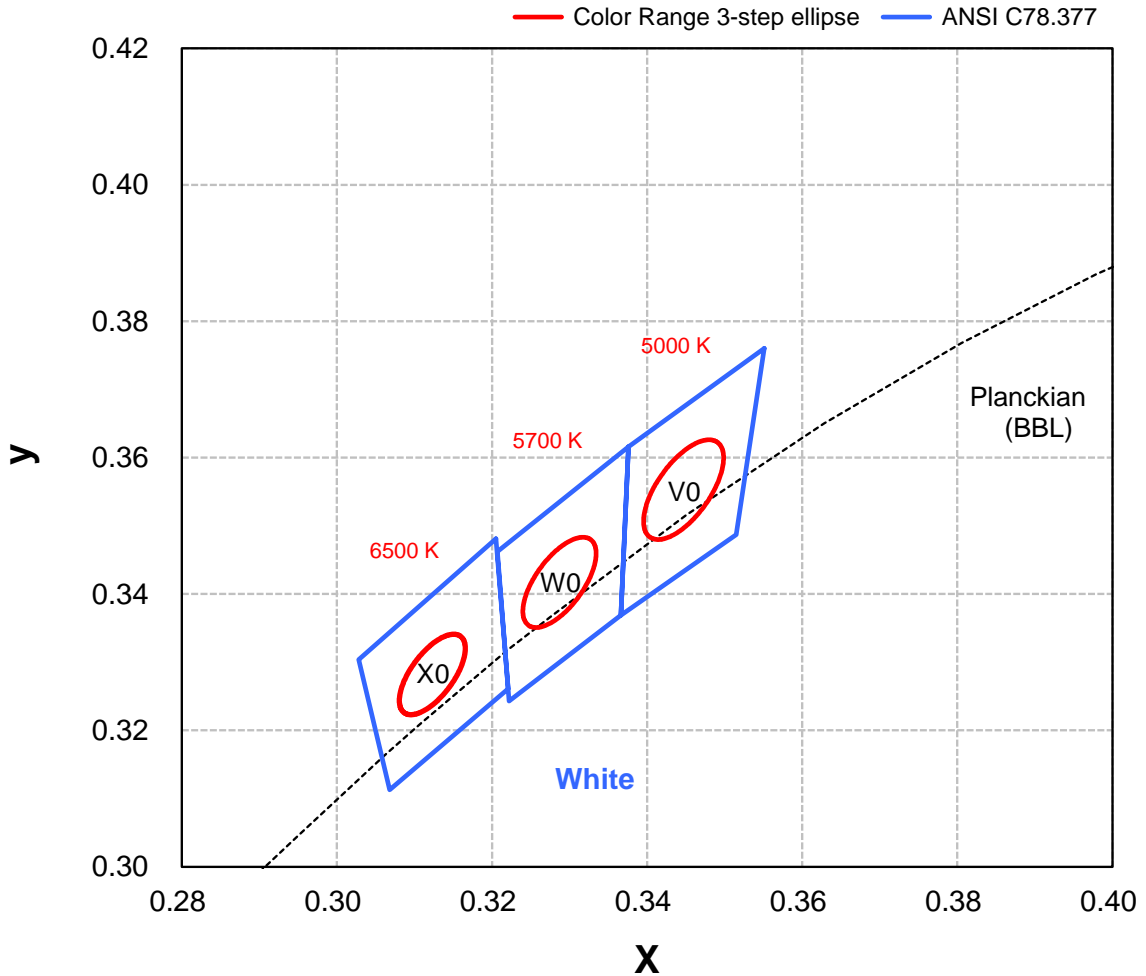
● All values are reference only.

## Absolute Maximum Ratings

Parameter	White/Neutral White/Warm White
Max DC Forward Current (mA)	1440
Max Voltage at 1440mA	42
Peak Pulsed Forward Current (mA)	2160 (less than 1/10 duty cycle@1KHz)
ESD Sensitivity (HBM per MIL-STD-883E Method 3015.7)	±2000V
LED Junction Temperature	120°C
Operating Board Temperature at Maximum DC Forward Current	-40°C - 90°C
Storage Temperature	-40°C - 120°C
Reverse Voltage	Not designed to be driven in reverse bias

## Color Bin

### White Binning Structure Graphical Representation



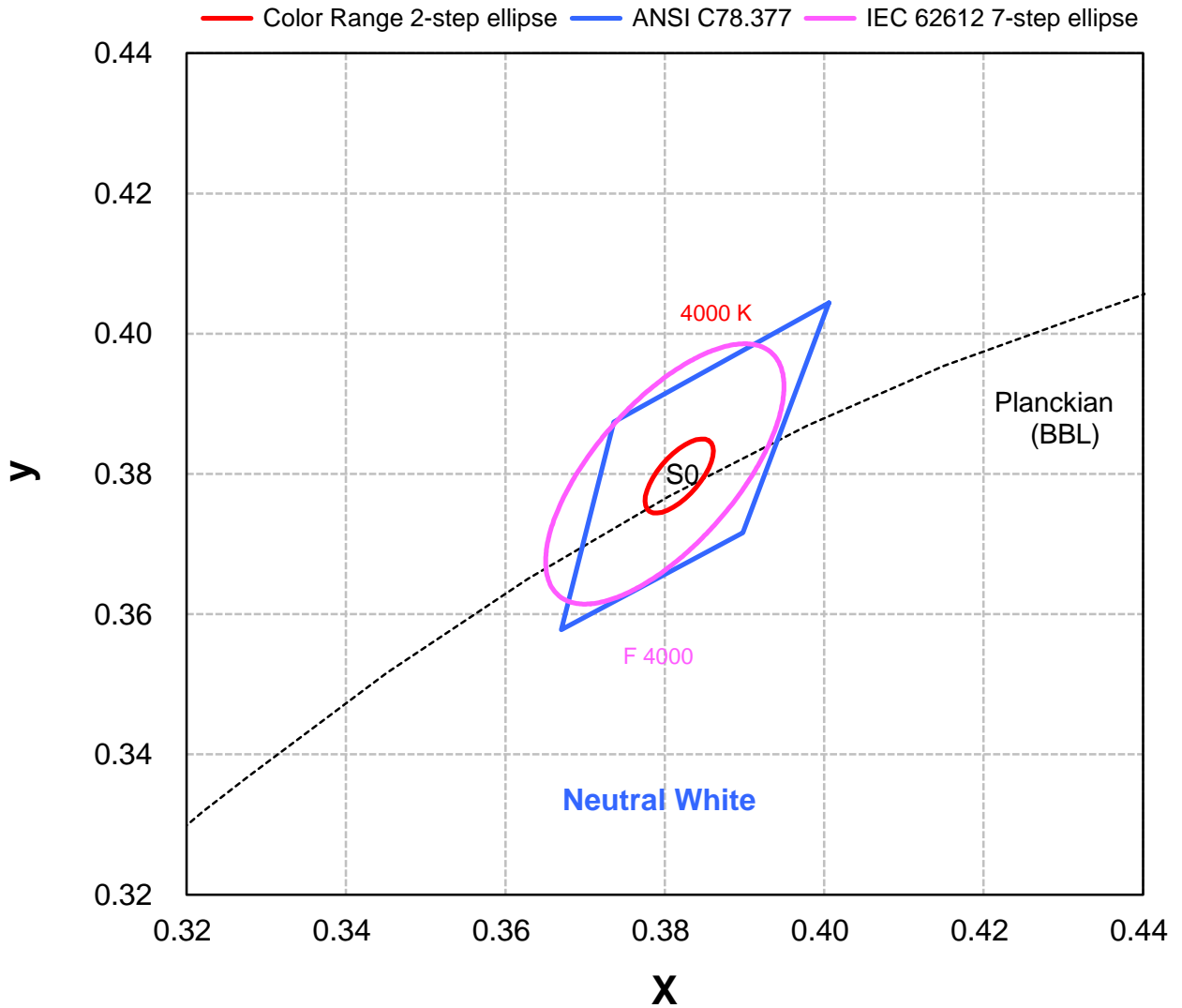
#### White Bin Structure

Bin Code	Center	Oval parameter	Typ. CCT (K)	Bin Code	Center	Oval parameter	Typ. CCT (K)
V0	x	a	5000	X0	x	a	6500
	y	b			y	B	
		e°				e°	
W0	x	a	5700				
	y	B					
		e°					

- Color range stay within MacAdam “3-step” ellipse from the chromaticity center.
- The chromaticity center refers to ANSI C78.377.
- Tolerance on each color bin (x , y) is  $\pm 0.005$

## Color Bin

### Neutral White Binning Structure Graphical Representation



#### Neutral White Bin Structure

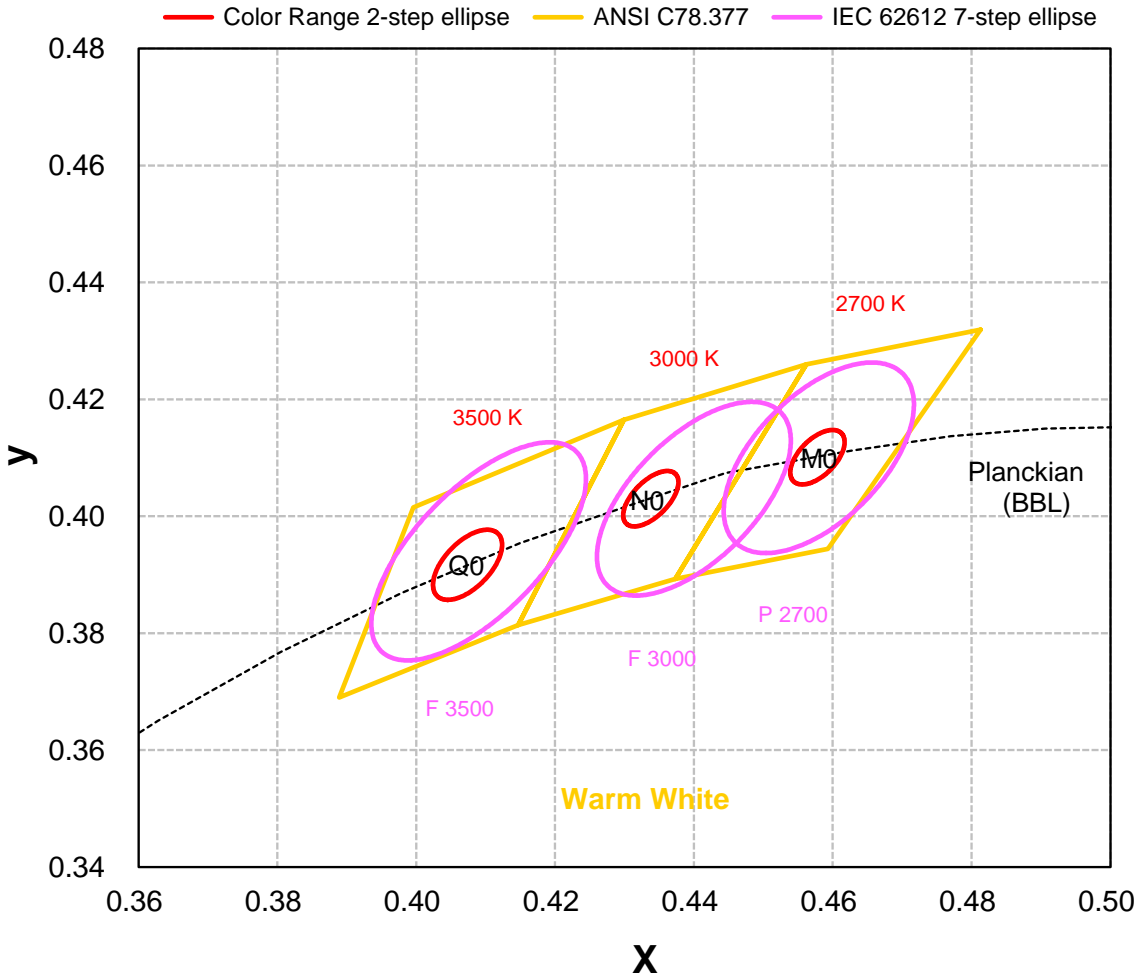
Bin Code	Center	Oval parameter	Typ. CCT (K)
S0	x	0.3818	4000
	y	0.3797	
	a	0.00626	
	b	0.00268	
		e°	53.72

- Color range stay within MacAdam "2-step" ellipse from the chromaticity center.
- The chromaticity center refers to ANSI C78.377.
- Tolerance on each color bin (x , y) is  $\pm 0.005$



## Color Bin

### Warm White Binning Structure Graphical Representation



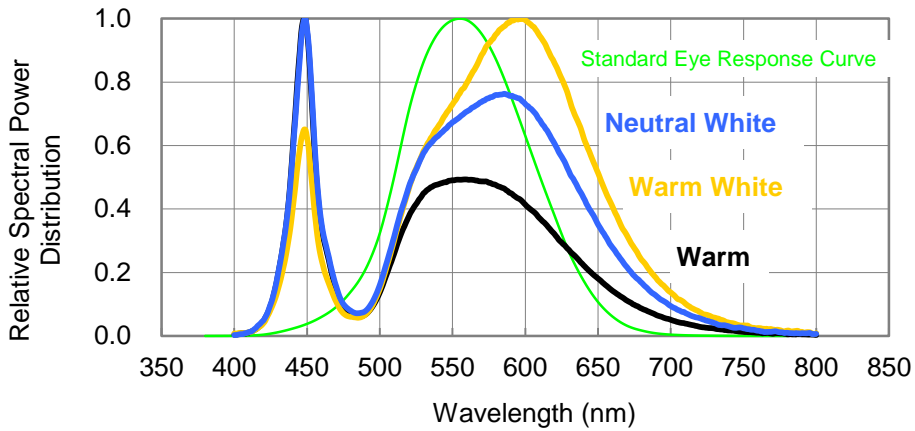
#### Warm White Bin Structure

Bin Code	Center	Oval parameter	Typ. CCT (K)	Bin Code	Center	Oval parameter	Typ. CCT (K)
M0	x	a	2700	Q0	x	a	3500
	y	b			y	b	
		e°				e°	
N0	x	a	3000				
	y	b					
		e°					

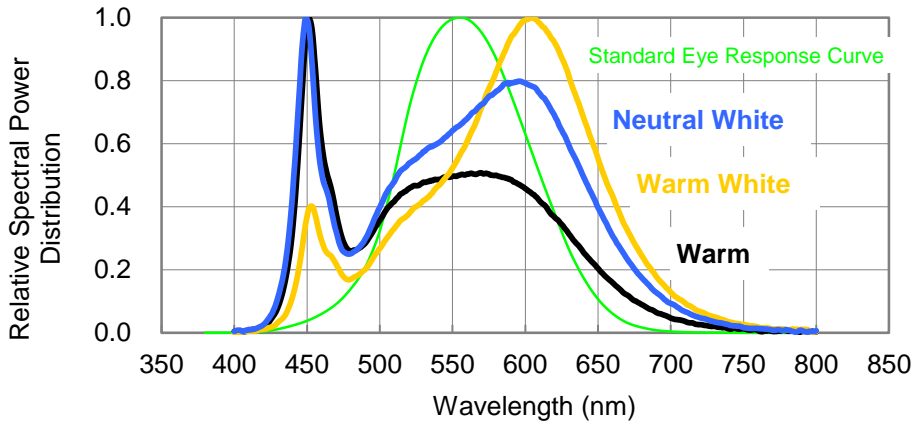
- Color range stay within MacAdam “2-step” ellipse from the chromaticity center.
- The chromaticity center refers to ANSI C78.377.
- Tolerance on each color bin (x , y) is  $\pm 0.005$

## Color Spectrum, $T_c = 25^\circ\text{C}$

1. PACK-57FWL-AC8N 、 PACK-57FNL-AC8N 、 PACK-57FVL-AC8N

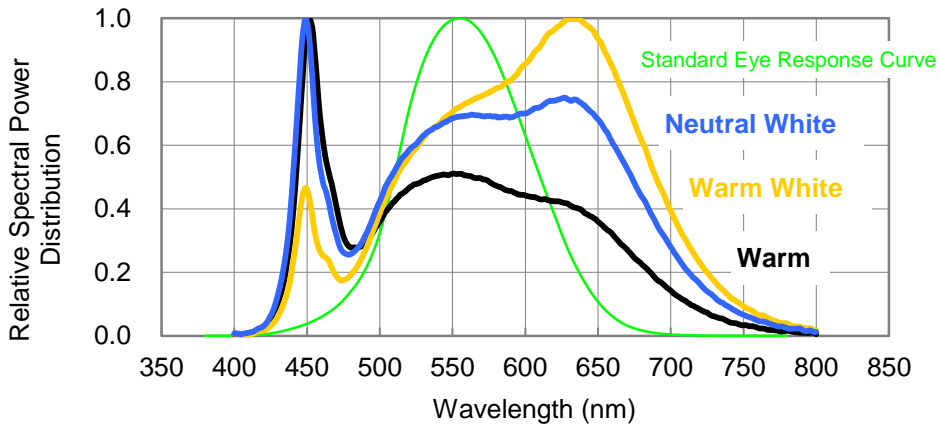


2. PACK-57FWL-BC8N 、 PACK-57FNL-BC8N 、 PACK-57FVL-BC8N

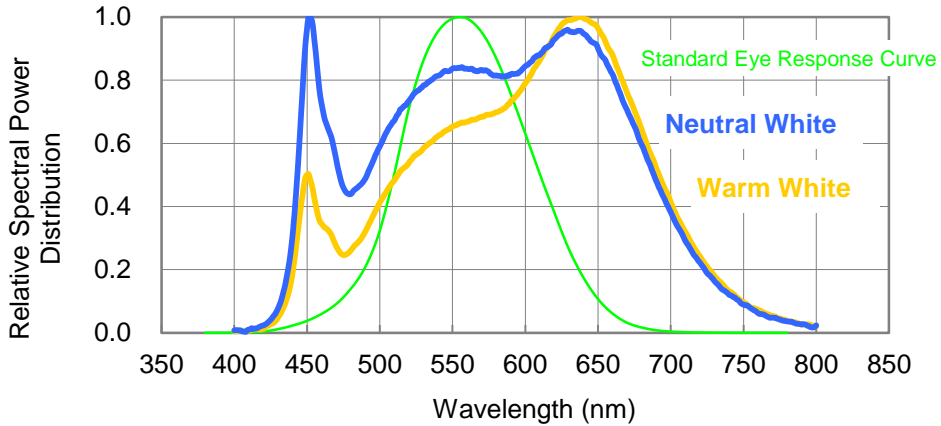


## Color Spectrum, $T_c = 25^\circ\text{C}$

3. PACK-57FWL-DC8N 、 PACK-57FNL-DC8N 、 PACK-57FVL-DC8N



4. PACK-57FNL-EC8N 、 PACK-57FVL-EC8N



## Case Temperature Relative Characteristics

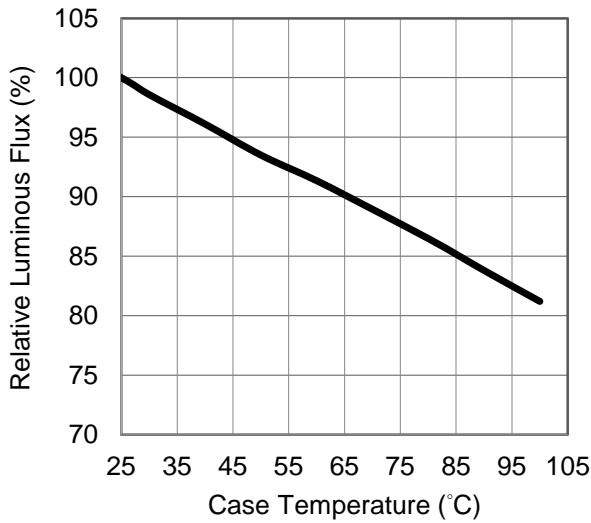


Fig 1. Case Temperature vs. Relative Luminous Flux at 720mA.

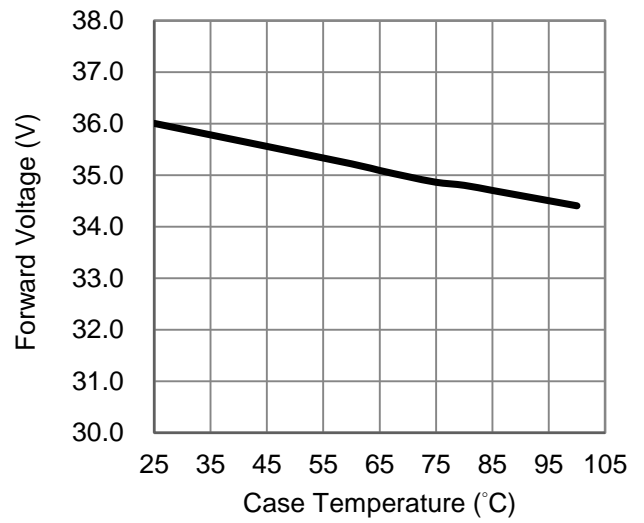


Fig 2. Case Temperature vs. Forward Voltage at 720mA.

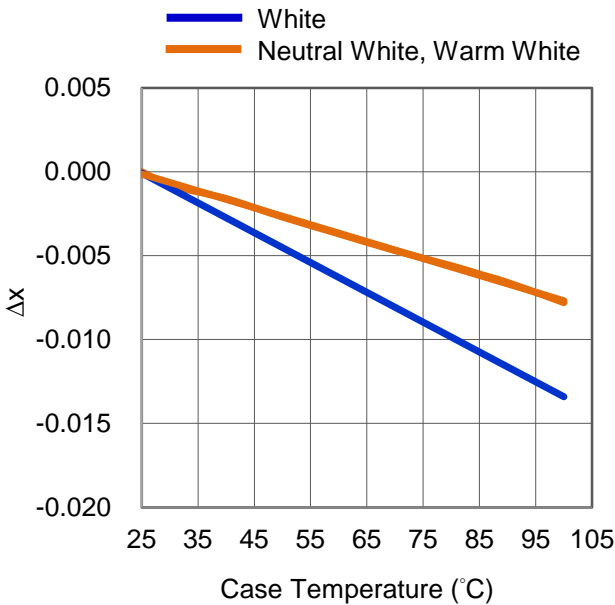


Fig 3. Case Temperature vs. Chromaticity Coordinate  $\Delta x$  at 720mA.

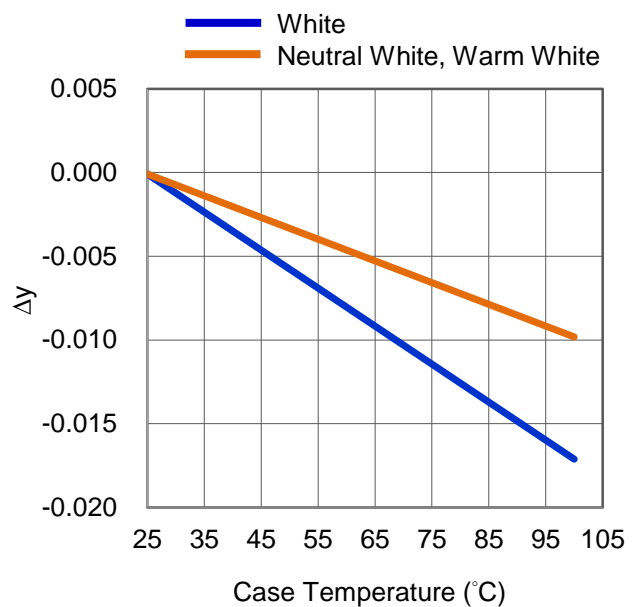


Fig 4. Case Temperature vs. Chromaticity Coordinate  $\Delta y$  at 720mA.

## Forward Current Relative Characteristics

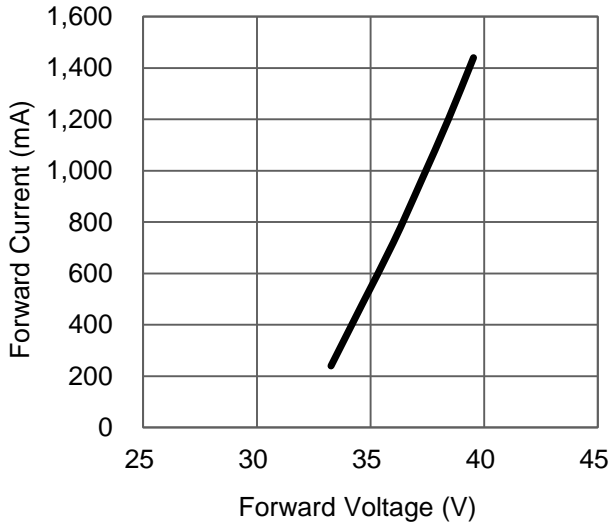


Fig 5. Forward Current vs. Forward Voltage at  $T_C=25^\circ\text{C}$ .

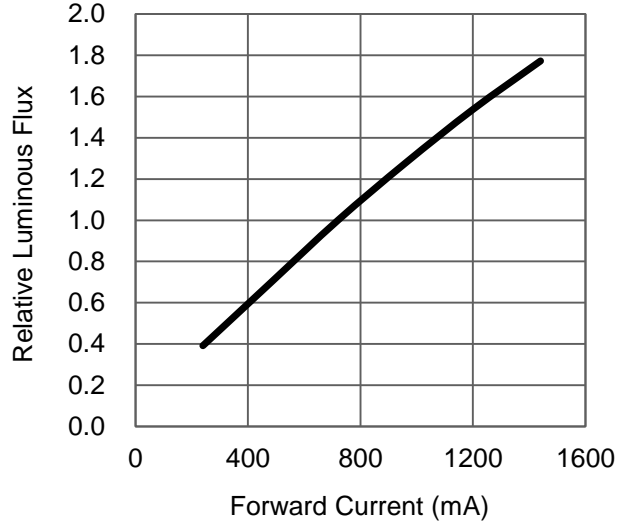


Fig 6. Forward Current vs. Relative Luminous Flux at  $T_C=25^\circ\text{C}$ .

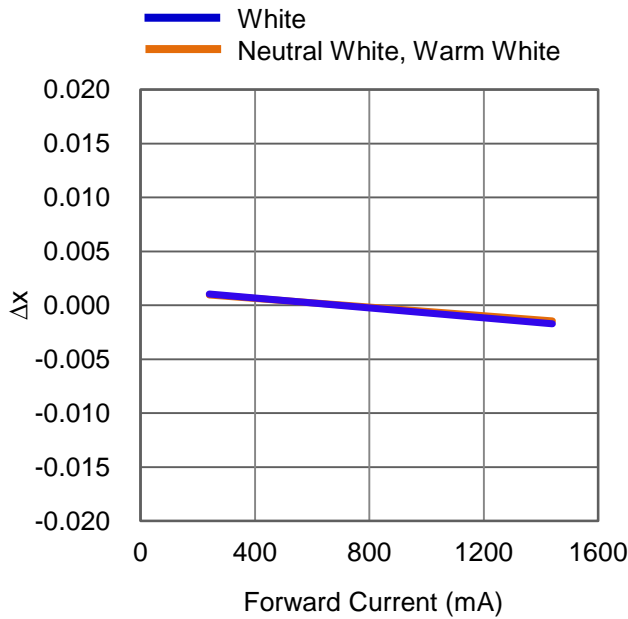


Fig 7. Forward Current vs. Chromaticity Coordinate  $\Delta x$  at  $T_C=25^\circ\text{C}$ .

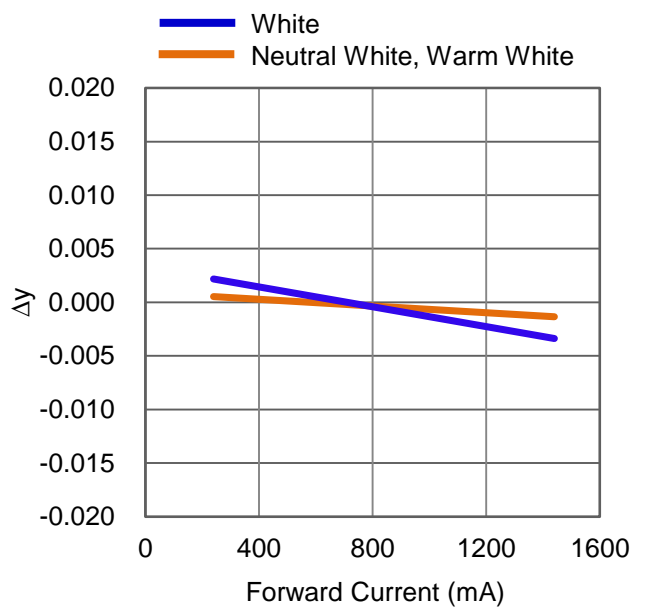


Fig 8. Forward Current vs. Chromaticity Coordinate  $\Delta y$  at  $T_C=25^\circ\text{C}$ .

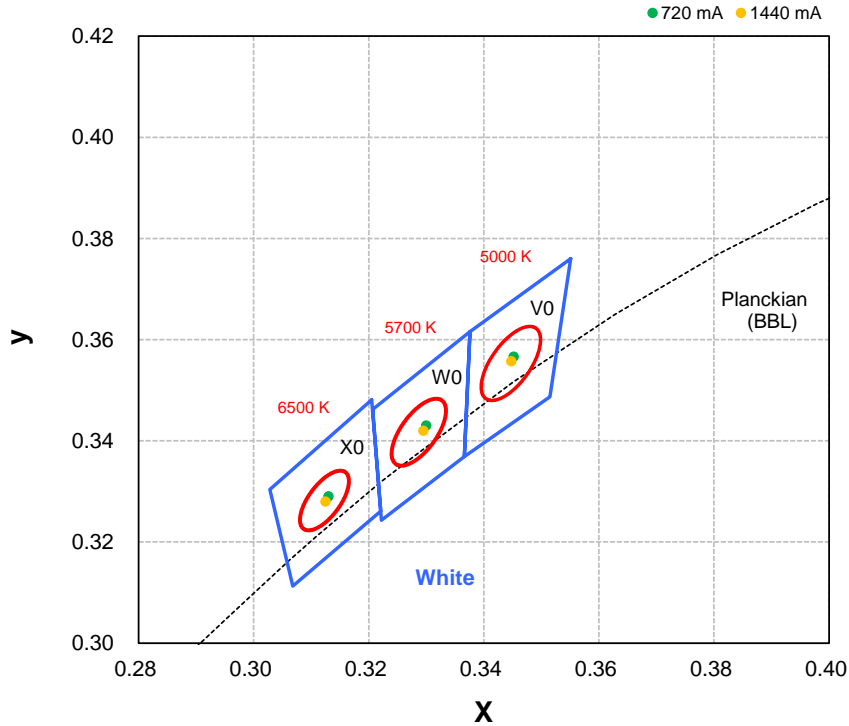
## Case Temperature vs. Junction Temperature Characteristics

T <sub>c</sub> (°C)	T <sub>j</sub> (°C)	
	720 (mA)	1440 (mA)
0	15	30
10	25	40
20	35	50
30	45	60
40	55	70
50	65	80
60	75	90
70	85	100
80	95	110
90	105	120

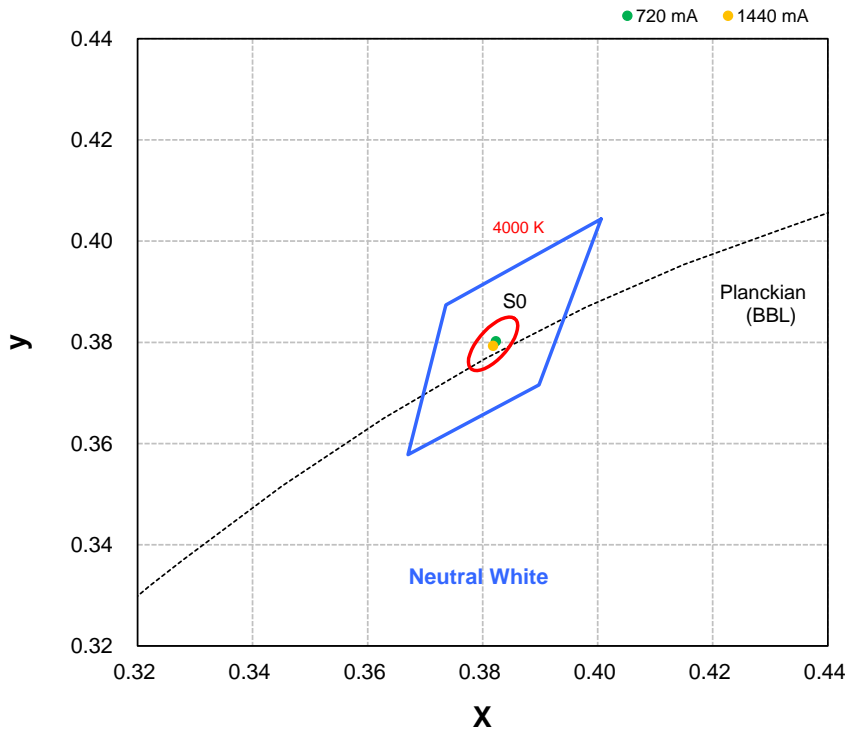
Fig 9. Case Temperature vs. Junction Temperature at 720 、1440mA.

# Color Coordinate vs. Forward Current, $T_c = 25^\circ\text{C}$

White Binning Graphical Representation

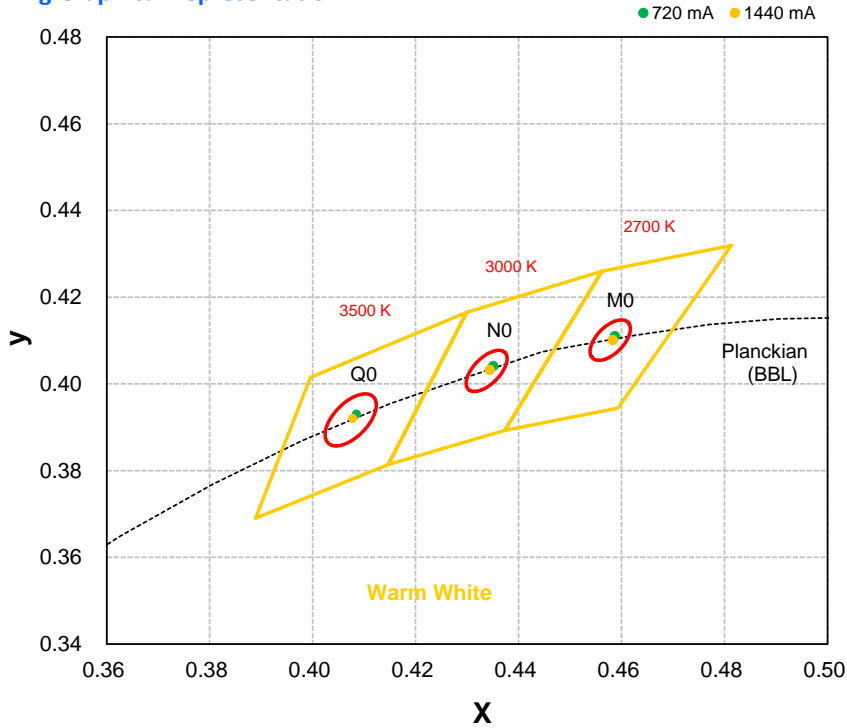


Neutral White Binning Graphical Representation



## Color Coordinate vs. Forward Current, $T_c = 25^\circ\text{C}$

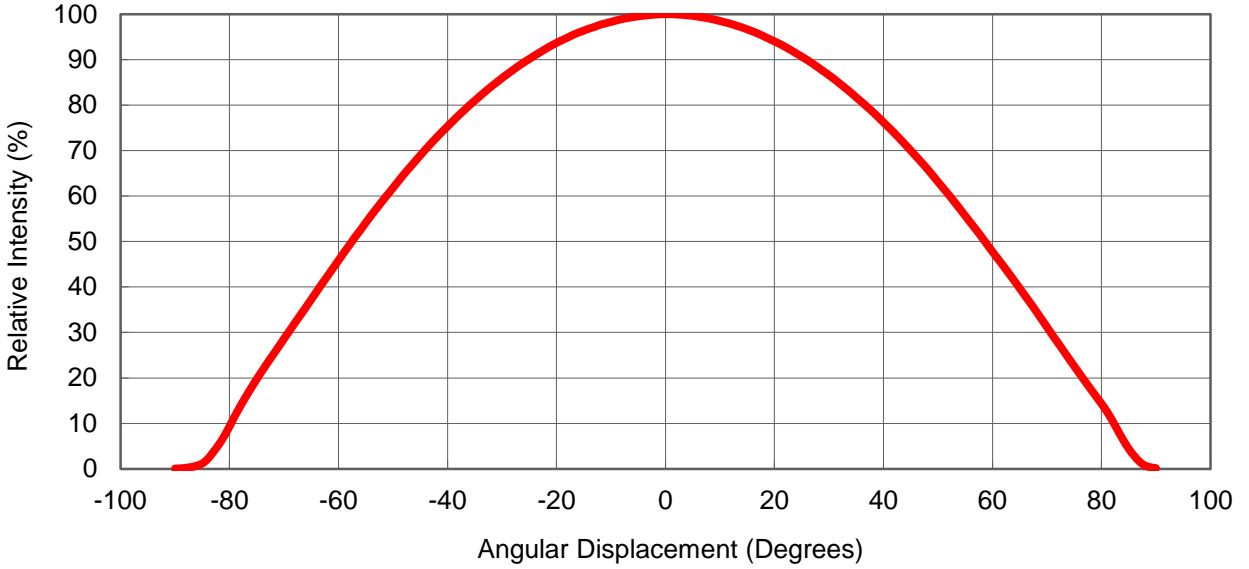
### Warm White Binning Graphical Representation



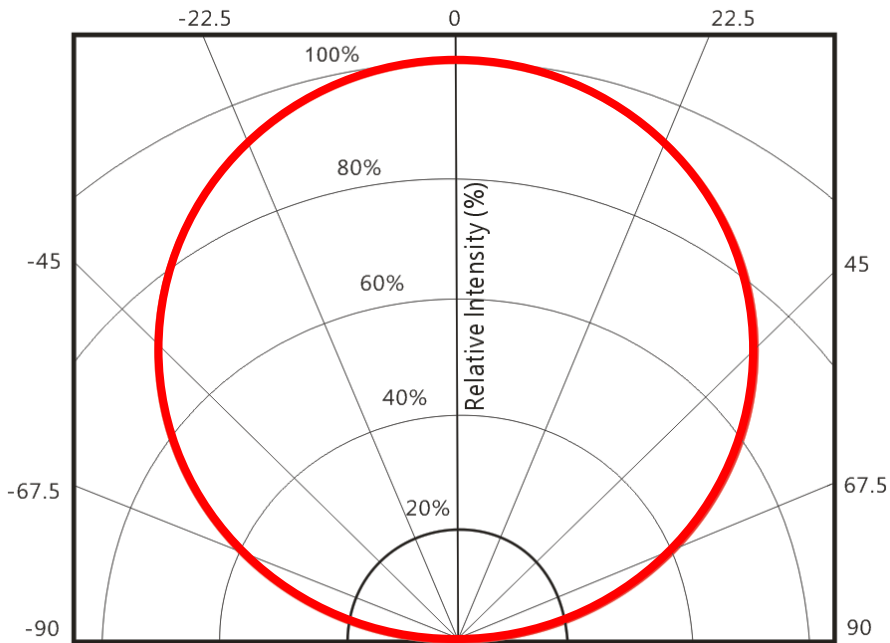


# Typical Representative Spatial Radiation Pattern

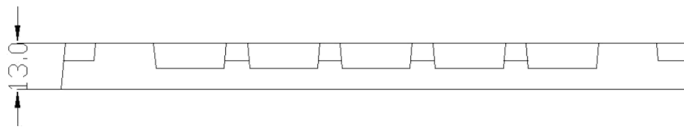
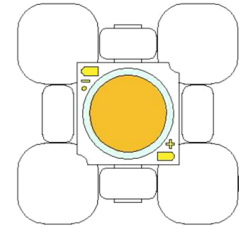
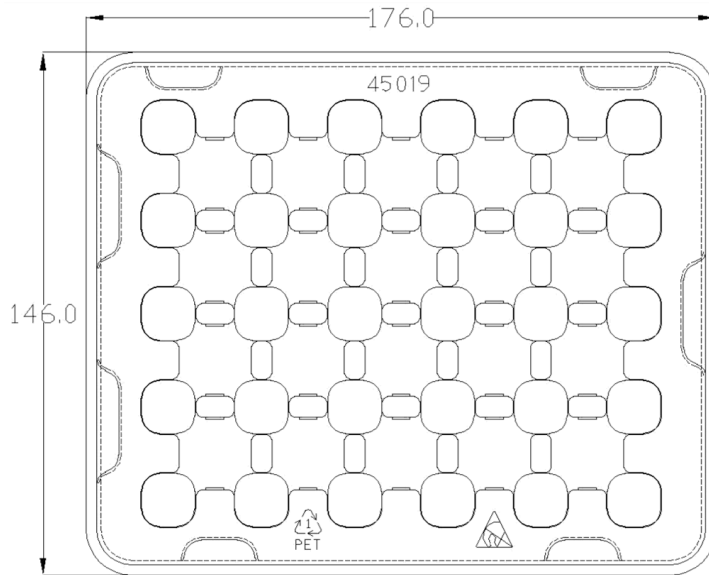
## Lambertian Radiation Pattern



## Polar Radiation Pattern



## Packing Specifications



Product 20 pcs/tray

Notes:

1. Drawing not to scale.
2. All dimensions are in millimeters.
3. Unless otherwise indicated, tolerances are  $\pm 0.20\text{mm}$ .

## Assembly note

Regarding the high power density of LED Array, it is strongly recommend to use thermal grease and screws.

In order to reduce thermal resistance at assembly, it is necessary to use TIM (thermal interface Material) uniformly and tighten screws on heatsink, otherwise the bad thermal resistance may cause the packages **burned out**.

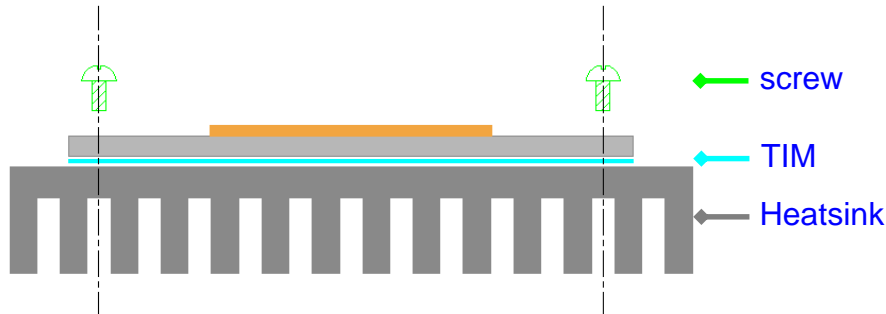


Fig 10. Reference assembly as fixing with screws

## Limited Warranty : COB Light Engine Series

This limited warranty is provided by ProLight Opto described below (“Seller”) to you as the original purchaser of the LED lighting product that is identified on Seller’s invoice reflecting its original purchase (the “Product”). We warrant the identification as such on the invoice, will be free of defects in material and workmanship for a period of five (5) YEARS from the date of original purchase. This limited warranty excludes field labor and service charges related to the repair or replacement of the Product. Seller’s aggregate liability with respect to a defective product shall in any event be limited to the monies paid to seller for that defective product. The determination of whether the Product is defective shall be made by Seller in its sole discretion with consideration given to the overall performance of the Product. This limited warranty cannot be transferred to subsequent purchasers of the Product, provided that such Product is resold in new condition and in its original packaging. This limited warranty is void if the product is not used for the purpose for which it is designed.

## Recommended Soldering Condition

- Please use lead free and “no clean ” solders.
- Soldering shall be implemented using a soldering tip at a temperature lower than 350 °C, and shall be finished within 3.5 seconds for each pad.
- During the soldering process, put the LEDs on materials whose conductivity is poor enough not to radiate heat of soldering.
- Properly solder tin wires before soldering them to LEDs.
- Avoid touching the silicone lens with the soldering iron.
- Please prevent flux from touching to the silicone lens.
- Please solder evenly on each pad.
- Contacts number of a soldering tip should be within twice for each pad.
- Next process of soldering should be carried out after the LEDs have return to ambient temperature.

\*ProLight cannot guarantee if usage exceeds these recommended conditions.

Please use it after sufficient verification is carried out on your own risk if absolutely necessary.

## Precaution for Use

- The modules light output are intense enough to cause injury to human eyes if viewed directly. Precautions must be taken to avoid looking directly at the modules with unprotected eyes.
- The modules are sensitive to electrostatic discharge. Appropriate ESD protection measures must be taken when working with the modules. Non-compliance with ESD protection measures may lead to damage or destruction of the product.
- Chemical solvents or cleaning agents must not be used to clean the modules. Mechanical stress on the Emitters must be avoided. It is best to use a soft brush, damp cloth or low-pressure compressed air.
- The products should be stored away from direct light in dry location.
- The appearance, specifications and flux bin of the product may be modified for improvement without notice. Please refer to the below website for the latest datasheets.  
<http://www.prolightopto.com/>

## Handling of Silicone Lens LEDs

Notes for handling of silicone lens LEDs

- Please do not use a force of over 0.3kgf impact or pressure on the silicone lens, otherwise it will cause a catastrophic failure.
- Avoid touching the silicone lens and the optical area of the COB Array especially by sharp tools such as Tweezers
- Avoid touching the silicone lens especially by sharp tools such as Tweezers.
- Avoid leaving fingerprints on the silicone lens.
- Please store the LEDs away from dusty areas or seal the product against dust.
- Please do not mold over the silicone lens with another resin. (epoxy, urethane, etc)

